

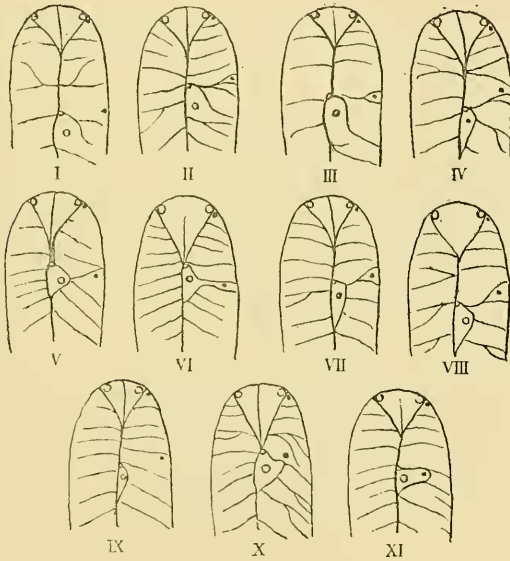
THE NEW ZEALAND ATHORACOPHORIDÆ, WITH DESCRIPTIONS  
OF TWO NEW FORMS.

By HENRY SUTER.

Read 16th April, 1909.

SINCE publishing a revision of this family<sup>1</sup> much more material has come to hand. Of great interest are the slugs collected by the late Captain Hutton, and recently by Professor W. B. Benham, F.R.S., during the scientific expedition to our sub-antarctic islands. I am thus enabled to correct a number of mistakes made in my revision, assisted also by the paper published by L. H. Plate<sup>2</sup> in 1898, "Beiträge zur Anatomie und Systematik der Janelliden." All the different forms, except *A. Schauinslandi*, are now in my collection.

To show the peculiarities of head-shield, mantle-area, position of the grooves, respiratory, renal, and anal orifices, the eleven diagrams which here follow have been drawn.



Genus *ATHORACOPHORUS*, Gould, 1852.

*Janella*, Gray, 1850; *non* Grateloup, 1838. *Neojanella*, Cockerell, 1891.

Subgen. 1. *ATHORACOPHORUS*, s.str.

Mantle-area not bounded on all sides by grooves; tentacles long, cylindrical; renal orifice inside the mantle-area.

<sup>1</sup> These Proceedings, 1897, vol. ii, p. 245.

<sup>2</sup> Zool. Jahrb. (Anat.), vol. xi, pp. 193-280.

1. *A. BITENTACULATUS* (Quoy & Gaimard), 1832.

*Limax bitentaculatus*, Q. & G.: Voy. Astrolabe, Zool., vol. ii, p. 149, pl. xiii, figs. 1-3.

*Janella maculata*, Collinge: P.Z.S., 1894, p. 527.

*Neojanella dubia*, Cockerell: P.Z.S., 1891, p. 217.

I have examined more specimens of *A. dubius*, Cokll., and found the central tooth of the radula always symmetrical on the posterior part of the radula, and sometimes, but not always, oblique or asymmetrical on the anterior part. As pointed out by Plate, the slight differences in the generative organs are not sufficient to separate this form from that which we consider to be *A. bitentaculatus*. Cockerell's species is from the south side of Cook Strait, and we are no doubt fully justified in assuming that it represents the typical *A. bitentaculatus*, which was found in Tasman Bay.

Var. *antipodum* (Gray), 1853.

*Janella antipodarum*, Gray: Ann. Mag. Nat. Hist., 1853, vol. xii, p. 414.

Differs from the species only in the absence of spots. Plate has shown that the animal dissected by Collinge (*A. bitentaculatus*) was sexually immature.

2. Nov. subsp. *rufovenosus*. Figs. 1-3.

Animal limaciform, moderately large, broad, with more or less rounded tail when at rest; long, slender, semi-cylindric, with pointed tail when crawling; semi-transparent, with an opaque and darker central area when alive. Colour yellowish, with numerous small white papillæ, median and side-grooves reddish-brown, with four longitudinal rows of brown spots close to the side-grooves; mantle-area and its neighbourhood orange; sole yellowish-white.

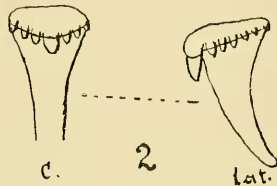


1.

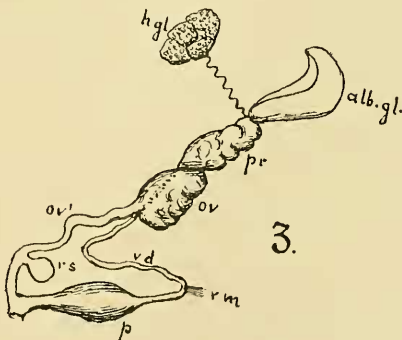
Spirit specimens are light yellow, the grooves more or less brown, and the spots are sometimes indistinct. Head with two distinct oval oral lobes; tentacles cylindrical; head-shield extending to about midway between head and mantle-area, with a median groove. Notum densely covered with small papillæ, median and side-grooves well pronounced, the latter occasionally bifurcating, their number being about fourteen on each side, ten of which are post-pallial. Mantle-area open on the right side, the respiratory orifice not far from the

median groove, the renal opening in front of it. Anus on the right side, close to the perinotum, in a triangle formed by the pre- and post-anal grooves. Generative orifice on the outer side of the right tentacle. Hyponotum broad, the perinotum thread-like. Sole aulacopod through contraction in alcohol. Shell rudiments consisting of about a dozen calcareous white grains of various sizes and shapes, the largest about  $1\frac{3}{4}$  mm.

Measurements of a large spirit specimen: length over back from head to tip of tail, 37 mm.; width of back to perinotum, 9 mm.; sole—length 33, breadth 4 mm.; breadth of hyponotum, 2.5 mm.; distance of anus from right tentacle, 7 mm.; from pulmonary orifice, 4 mm.; pulmonary orifice from head, 10 mm.; generative pore from pulmonary orifice, 9 mm.



Jaw elasmognathic. Radula with very numerous teeth, the central tooth (Fig. 2, *c.*) with a larger median and six lateral denticles, three on each side. Lateral teeth (Fig. 2, *lat.*) with an inner large and six outer smaller denticles.



Reproductive organs (Fig. 3). The hermaphrodite gland is of moderate size, brownish, the albumen gland rather large, smooth, yellowish-white; there are no accessory glands below it; the prostate above and the oviduct below are of nearly equal size, the latter is prolonged into a somewhat convoluted free oviduct with a proximal receptaculum seminis. The sheath of the male organ is not long,

oval, narrowed distally, with the retractor muscle at the bend where the vas deferens begins. The intromittant organ has papillæ inside.

Type in my collection.

*Hab.*—North Island: Tuakau (type); vicinity of Auckland; Waitakerei Range; Stratford.

Very often found in leaf-sheaths of Nikau palms.

*Remarks.*—This subspecies was formerly included in *A. bitentaculatus*, and is the form mentioned by me as being semi-transparent and having an orange mantle-area. It is also distinguished from the species by the brown grooves, the rows of brown spots close to the side-grooves, the mantle-area limited in front and behind by a groove and open on the side, and the presence of a pre-anal groove.

Subgen. 2. CONOPHORA, Hutton, 1879.

*Konophora*, Hutton: Trans. N. Zeal. Inst., 1879, vol. xi, p. 332.

Slugs with the mantle-area open on the right side, the renal orifice in front of it, separated by a more or less distinct groove; tentacles short, conical.

3. *A. MARMOREUS* (Hutton).

*Konophora marmorea*, Hutt.: Trans. N. Zeal. Inst., 1879, vol. xi, p. 332; vol. xiv, p. 158, pl. v, figs. 1, 2.

*Hab.*—Dunedin (type); Ashburton; Resolution Island.

Subgen. 3. PSEUDANEITEA, Cockerell.

*Pseudaneitea*, Ckll.: P.Z.S., 1891, p. 217. Type, *A. papillatus*, Hutt.

Slugs of New Zealand and its sub-antarctic islands, resembling *Athoracophorus*, s.str., but showing a decided tendency towards the formation of a mantle-area like that of *Aneitea*.

These slugs are not always small. Notum usually finely granulate, with larger raised tubercles or papillæ between the lateral grooves. Mantle-area distinct, triangular or rarely quadrangular, enclosing the respiratory and renal orifices. Anus near the perinotum.

4. *A. DENDYI*, Suter.

*A. Dendyi*, Sut.: Proc. Mal. Soc., 1897, vol. ii, p. 253, figs. 12-17 in text.

There is no spermoviduct. In fig. xiv on p. 254 *pr.* is the bulbous gland (Knollendrüse of Plate), not the prostate, and *ov.* is the glomerate gland (Knäueldrüse of Plate), not the oviduct. The receptaculum seminis is distal.

5. *A. HUTTONI*, Suter, n.sp.

This new species will be described and figured in the report on the scientific expedition to the sub-antarctic islands.

*Hab.*—Snares Islands (Captain Hutton and Dr. Colquhoun); Campbell Island (Des Barres and Chambers).

6. *A. MARTENSI*, n.nov.

*A. marmoratus* (v. Mts.), Simroth: Nova Acta Leop.-Carol. Deutsch. Akad. Naturf., 1889, vol. liv, p. 71, pl. iv, figs. 3-10; *non A. marmoreus*, Hutt., 1879.

As may be seen from the diagrams, this species is quite distinct

from Hutton's *marmoratus*. The name bestowed on the species by the late von Martens cannot stand, and I now propose the above name.

*Hab.*—Auckland Islands (Dr. Krone, Captains Hutton, Bollous, and Professor Benham); Macquarie Island (Dr. Colquhoun).

7. *A. PAPILLATUS* (Hutton), 1879.

*Janella papillata*, Hutt.: Trans. N. Zeal. Inst., 1879, vol. xi, p. 332.

*A. verrucosus* (v. Mts.), Simroth: Suter, Proc. Mal. Soc., vol. ii, p. 251; *non* Simroth.

There is no spermoviduct and no prostate, only the accessory bulbous and glomerate glands. Receptaculum seminis proximal.

This species is very variable in colour, either uniformly olive or dark coloured with the papillæ of lighter colour, or yellowish with rows of large brown spots. *A. verrucosus* is a very distinct species.

*Hab.*—North Island: Heretaunga and Forty Mile Bush. South Island: Pelorus Valley, Nelson, Greymouth, Little River, Riccarton Bush, Governor's Bay, Hooker Valley, Ashburton, and Invercargill. Chatham Islands (*vide* Hutton).

8. *A. SCHAUINSLANDI* (Plate), 1897.

*Janella Schauinslandi*, Plate: Sitz. Ber. Naturf. Fr. Berlin, 1897, p. 141; Zool. Jahrb., Anat., vol. xi, pp. 193–269, pls. xii–xvi.

Very near *A. papillatus*, but the head-shield without a median groove; the side-grooves less numerous, about fifteen against twenty; the lateral fields of notum with two to four papillæ only, but about six in *A. papillatus*; the central tooth of the radula with three denticles, and the receptaculum seminis distal.

*Hab.*—Stephens Island, Cook Strait (Professor Schauinsland).

9. *A. SIMROTHI*, Suter, 1896.

*A. Simrothi*, Sut.: Proc. Mal. Soc., 1896, vol. ii, p. 34, pl. iv, figs. 3, 4; p. 253.

No other specimen has turned up, and the anatomy still remains unknown. Plate suggested that it might be a young specimen of *papillatus* or *Schauinslandi*, but I cannot share this view. The large, oval, crowded papillæ distinguish it at once from all the other hitherto known species of the genus.

Subgen. 4. AMPHICONOPHORA, Suter, 1897.

*Amphikonophora*, Suter: Proc. Mal. Soc., 1897, vol. ii, p. 256. Type, *A. giganteus*, Suter.

New Zealand slugs with dorsal, median, and lateral grooves; mantle-area distinct, triangular, with the renal orifice inside its anterior angle, the pulmonary opening sub-central. Anus near the mantle-area, sometimes inside it.

10. *A. GIGANTEUS*, n.sp. Figs. 4–7.

*A. marmoratus* (v. Mts.), Simroth: Suter, Proc. Mal. Soc., 1897, vol. ii, p. 256, fig. xviii in text; *non* Simroth.

Animal (spirit specimen) large, limaciform, broad in front and very gradually tapering toward the broadly rounded tail; back flatly convex,

with deep grooves and numerous small papillæ; head-shield with median groove; anus on right side of mantle-area. Colour uniformly yellowish-white, the larger papillæ whitish. Head broad, oval, the two tentacles retracted, mouth with two upper labial lobes which nearly meet in the middle, surmounted by a median triangular lobe. Notum with a deep median groove and inequidistant oblique lateral grooves, about fifteen on each side, eight of which are post-pallial, most of them bifurcating toward the margin; the whole surface covered with small granules, amongst which are numerous slightly larger papillæ in most of the side-fields behind the mantle-area. Head-shield triangular with a median groove, the posterior part reaching



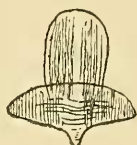
4.

to the mantle-area, which is triangular, its length nearly twice its breadth, enclosed by grooves on all sides; the respiratory orifice sub-central; the renal aperture in the anterior angle. Anal opening close to the mantle-area, just in front of the outer angle, with a curved pre-anal groove. The generative orifice on the outer side of the right tentacle; the figure shows the exerted male organ thickly beset with small, sharp papillæ. The hyponotum is indistinct, the perinotum consisting of tubercular oval swellings of the margin of the notum. Sole aulacopod through contraction in alcohol, the side-fields with numerous transverse grooves, central part smooth; in front the sole is separated from the head by a deep groove. Shell rudimentary, consisting of very numerous and small calcareous grains, no larger ones amongst them.

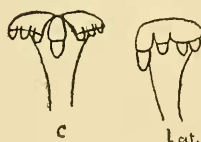
Measurements of type-specimen: Length over back from head to tip of tail, 92 mm.; width of back to perinotum, 32 mm.; sole—length 71, breadth 19 mm.; breadth of hyponotum, 4 mm.; distance of anus from right tentacle, 16 mm.; from pulmonary orifice, 5 mm.; pulmonary orifice from head, 22 mm. This slug, when alive and crawling, had a length of 130 mm.

Jaw (Fig. 5) elasmognathic, with a sharp median projection. Radula large, with numerous teeth. Central tooth (Fig. 6, *c.*) with three cusps, the median small and with one cutting point, the lateral ones triangular with two or three denticles on each. Lateral teeth (Fig. 6, *lat.*) with four denticles, the inner one largest.

Generative organs (Fig. 7). The hermaphrodite gland is not large, globular; the albumen gland is yellowish, tongue-shaped, compact; the prostate is composed of globular and oval dark-grey convolutions; oviduct long, yellow, the vas deferens adhering to it; there are no



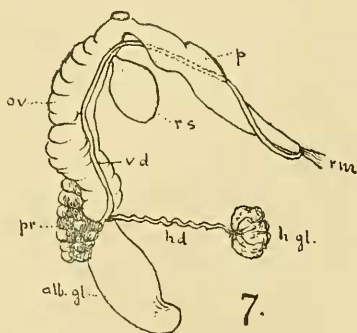
5.



6

accessory glands. Vagina very short. Sheath of male organ long, thick, tapering very gradually to the posterior end,  $\frac{2}{3}$  where the vas deferens enters and the retractor muscle is fixed; verge with numerous small, pointed papillæ.

Type in my collection.



7.

*Hab.*—South Island: Collingwood, in a birch-tree (type); Chausille Ridge, South Westland, one specimen at an elevation of 5,500 feet; this specimen was sent to the Canterbury Museum, Christchurch, by the Rev. H. E. Newton, of Ross.

*Remarks.*—This is the largest species of *Athoracophorus* known. The stomach of the specimen I dissected contained a large amount of greyish-black wood fibres.

11. *A. verrucosus* (v. Mts.), Simroth.

*A. verrucosus* (v. Mts.), Simroth: Nova Acta Leop.-Carol. Deutsch.

Akad. Naturf., 1889, vol. liv, p. 77, pl. iv, figs. 11-14.

Var. *nigricans* (v. Mts.), Simroth: t.c., p. 77.

Var. *fasciatus* (v. Mts.), Simroth, em. (*fuscatus*): t.c., p. 79.

I examined the radula of one specimen, and could find no trace of a rhachidian tooth. The lateral teeth have nine denticles, the inner one being the largest.

*Hab.*—Auckland Islands (Dr. Krone and Professor Benham).

The following table will, together with the diagrams given (p. 321), facilitate the separation of the species.